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8 November 1979

MEMORANDUM FOR THE RECORD

SUBJECT: CATIS Briefing

1. General

On Tuesday 23 October 1979, Capt. John Jacobson (AFIS/IND, phone: 767-4395) assisted by [redacted] Project Engineer, Bunker Ramo, [redacted]

[redacted] consultant, SAI Sensor Systems Division, [redacted] briefed the DASITT on the Computer Aided Tactical Information System (CATIS) and on Advanced Reporting Concepts. DASITT attendees were:

[redacted]

IRO
IRO
CIA

Lt. Col. Bill Gray AFIS

[redacted]

[redacted]

2. Requirement

CATIS came into being in 1975 when most existing U&S Command imagery support ADP systems were found to be inadequate to handle the increased volume [redacted] and other locally controlled imaging resources (e.g.: RF4C). The aging IDHS IBM System/360 baseline couldn't cope with the current load due to poor on-line and communications resources. Sentinel Aides was integrated with the IDHS. PACER and AIRES were both hosted by expensive mainframes. The TIPI II Segment contained costly otherwise unusable equipment. [redacted]

3. Development

The USAF Intelligence Service with contractor support has developed the current, working system. The functional specification was developed by AFIS in late 1976 through the coordinated efforts of EUCOM (497 RTS), AF Air Intelligence Training Center (AFAITC), and LANTCOM

USAF review(s) completed.

[redacted]

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(FICEURLANT). The system structure was based in the concept of standardization:

- * Hardware: AN/GYQ-21 (V):
DEC PDP-11/70 (one or two processors)
BR 1569 Multiplexer
BR 1538 Disks
Sperry Univac 1652 Terminals
- * Software: CUBIC Standards:
Standard Software Base (SSB)
Storage and Retrieval Processor (SARP)
Terminal Transparent Display Language (TTDL)
Display Transaction Processor (DTP)
- * Courseware: AFAITC Standard

The displays and data bases were patterned after AIRES with appropriate changes for the U&S Command environment and DIAM 57-5 standards. Figures 1 and 2 show the overall CATIS hardware and software configurations.

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4. Schedule and System Size

Deliveries of CATIS to users was on the schedule and with the system size shown below:

Command	date IOC	# of terminals	# of processors
USAFE	12-78	16	2
PACAF	1-79	18	2 (?)
TAC	3-79	11	2
FICEURLANT	6-79	8	1 (?)
AFAITC	11-79	(?)	1 (?)

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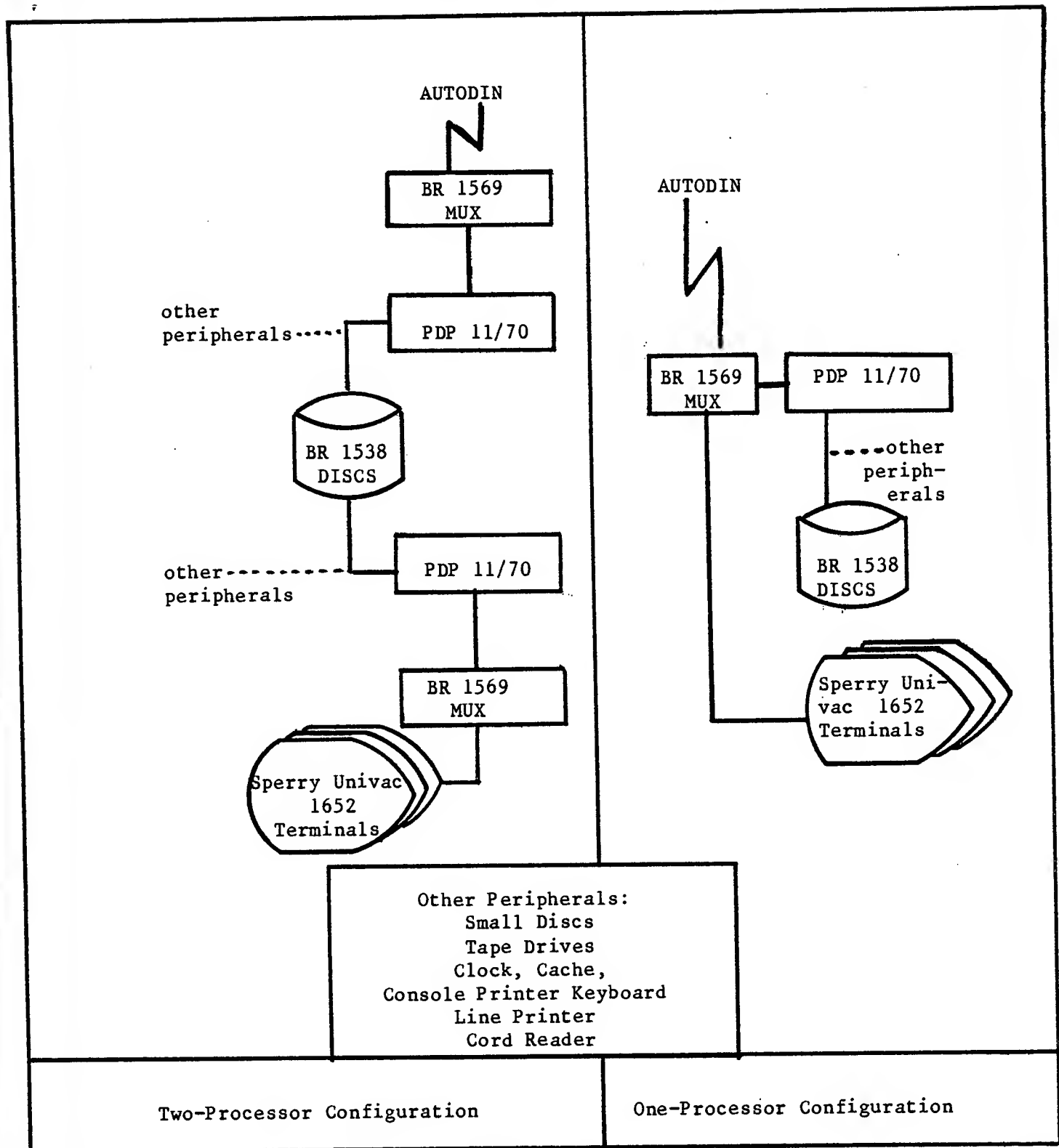
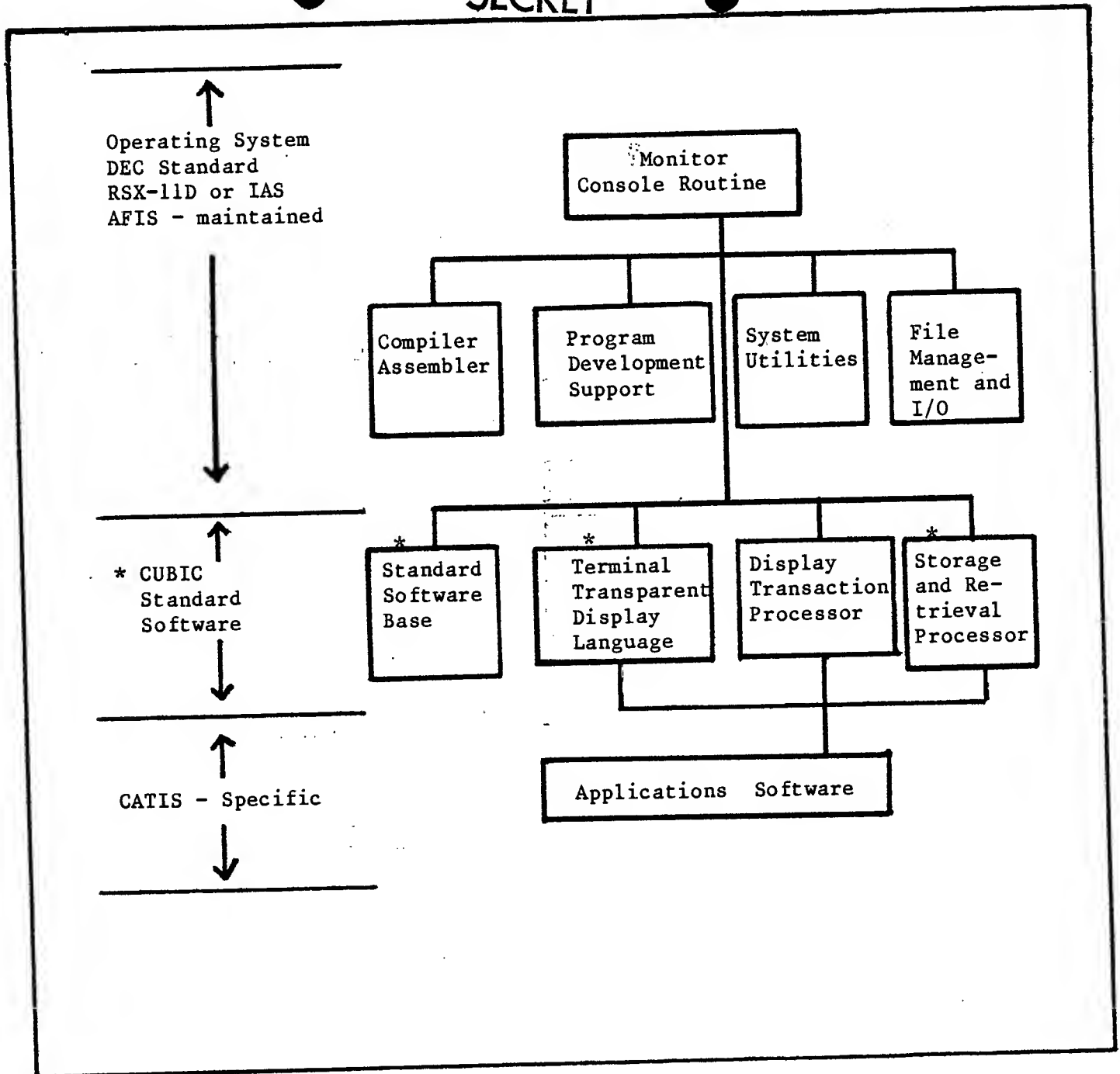


Figure 1: CATIS Hardware Configuration

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Figure 2: CATIS Software Configuration

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5. System Functionality

a. Data Base Loading

The primary source of data for CATIS is in AIRES' AIF, IROF, and EOB files. These are initially loaded into CATIS' IDB and HOC files through the SARP bulk load capability.

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b. Data Base Management

CATIS has a "profile" capability with which it routes incoming messages from the AUTODIN port. Some can go directly to the IDB, others to the Resource Manager Terminal. Criteria for routing are report type, producer, precedence (by message) or category, country code, WAC (by item). Any "problem record" - ones that have "illegal" values in certain checkable fields-are routed to the Data Base Managery Terminal.

c. Ephemeris Processing

The Automatic Target Correlation (TAC) algorithm performs the "predict" function using an AUTODIN-communicated, AIRES message, a CMCI tape, a sensor log tape or manual input. The ATC produces a list of all targets in each frame in exploitation priority order. Additionally, the Mission Status File (MSF) and the CMCTI are updated.

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d. Imagery Exploitation Support

This cluster of functions, available from an Imagery Interpreter's Terminal, supports:

Task Determination,
Multiple Coverage Check,
History of Coverage,
Target History,
Target Specifications,
EEI Display,
Report Item Creation, and
Header Generation.

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The files accessed are:

Mission Status File (MSF),
CMCTI,
History of Coverage (HOC)
Imagery Data Base (IDB)
EEI File, and
Report Item File (RIF)

The MSF tells the PI what to do. HOC gives all previous coverage of target. IDB target history data is automatically transferred into the RIF item format to edit already-stored data easily. It's all done with function keys; there are 60 on the terminal - a lot. If most or all are used, it may be confusing to a neophyte. All administrative - recording data-tasks dealing with a single target can be handled using a terminal in about a minute by a "trained 3 - striper". []

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e. Review and Validation

The Review and Validation Terminal has access to all the exploitation support functions as well as the editing ability for items in the RIF. []

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f. Report Assembly and Transmission

The same Review and Validation Terminal has access to the assembly function which combines items from the RIF with a PI report header and places the generated message into the Assembled Report File (ARF). The report transmission function moves messages out of the ARF to only the [] side of the AUTODIN port for transmission and to the data base (IDB file for substance, HOC file for quality). No GENSER (R) traffic is transmitted directly by CATIS due to the system-high data base. R messages are transmitted using a torn-tape technique. [] [] messages are received directly. []

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6. CATIS Experience

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EUCOM/USAFE/497 RTS has shown a dramatic [] improvement in exploitation report output in the first few months of use of their CATIS. They're using some of the Exploitation Management features of CATIS to support their Collection Management mission; AFIS encourages local augmentation. Queries take 5-15 seconds to "complete" - first terminal response. []

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7. Futures

a. Immediate Developments

Currently, files are BE number-oriented; a Geo-coordinate file is being added to allow point coordinate-oriented data. EUCOM interface to DDP is being developed through a [REDACTED] data link - [REDACTED] "Additional Installation Data" is a set of data elements available from the AIF or IROF that "this" CATIS installation wants in addition to the standard subset; this is a read-only area associated with targets that is filled the next time the AIF or IROF is passed by the CATIS data base; this feature is being developed as a hedge against local file structure modification. Interface to the TIPI II segment is a skim of the IDB, though CATIS contains not all the data the II segment needs. After the initial CATIS to TIPI load, photo data can be maintained at the TIPI location via AUTODIN from CATIS.

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b. Long Term

Three alternative directions lie ahead of CATIS, which is soon processor bound:

- * Larger Processor (e.g. VAX-11/780)
- * Multiple Processors (e.g. PDP-11/74)
- * Distributed Processors (e.g. SARP, SSB, etc.)

Capt. Jacobson would like to see the last of these started in development within this fiscal year as his legacy to the AFIS. This sort of hardware can be integrated into comm centers for maintenance purposes, with data wires just like to teletypes in various offices.

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8. Advanced Reporting Concepts

The SAI analysis recommends reducing the volume of characters representing a fixed PI report stream transmitted by exploitation organizations into AUTODIN and reducing the amount of information transmitted by exploitation organizations through the use of profiling

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and filtering. The study suggests volume reduction through:

- * COMM & REPORT OVERHEAD REDUCTION,
- * ELIMINATE UNNECESSARY TRAILING BLANKS,
- * TRANSMIT ONLY NECESSARY DATA,
- * OPTIMIZE USE OF 57-5 FORMAT, and
- * APPROPRIATE USE OF STANDARD ABBREVIATIONS.

The objective of profiling and filtering is to reduce commo loading and to reduce the flood of data dumped on the user. The impact on the producer can be overwhelming. The alternative is for users to select an OPIR (operational PI report) format for the reduced level of detail; advantages:

- * OPIR ALSO MACHINE GENERATABLE AND MACHINE READABLE
- * REDUCES FILTER COMBINATIONS TO TWO: OPIR OR 57-5

The analysis shows the possibility of reducing the report volume by a total of 75% by implementing the recommendations. [redacted]

CATIS raised productivity at the 497 RTS from [redacted]

[redacted] PACER's productivity increase at SAC amounts to about [redacted] usual military PI's spend about 15 minutes/frame; [redacted] feels this should be reduced to 5 minutes/frame due to near future increases in volume (e.g. TR-1) [redacted]

The concept of the OPIR was sent out by DIA for comment on 10 October 1979. By 22 October 1979, four responses had been received, all favorable. [redacted]

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